BY ORDER OF THE SUPERINTENDENT

HQ USAFA INSTRUCTION 36-2601

27 October 2000

Personnel

USAFA SURVEY PROGRAM

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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OPR: HQ USAFA/XP (Maj Kari Thyne)

Certified by: HQ USAFA/XP (Lt Col Bernard Asiu)

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This instruction implements AFPD 36-26, *Military Force Management*, and references DoDI 1100.13, *Surveys of Department of Defense Personnel,* and AFI 36-2601, *Air Force Personnel Survey Program.* It provides guidance on authorizing and conducting surveys (to include polls, questionnaires, interviews, or any other means of collecting attitude, opinion, preference or intent data) on the USAFA or involving USAFA personnel. The program is structured to ensure individual responses are protected and that no adverse actions result from any individual's responses to an official USAFA survey. The Officer of Primary Responsibility (OPR) for this program is the Institutional Research and Assessment Division (HQ USAFA/XPR).

SUMMARY OF REVISIONS

Delegates responsibility for compliance of this instruction to instructors and project officers for cadet surveys; includes disclaimer (paragraph **1.2.2.**) for cadet survey projects; excludes point of service customer service surveys (paragraph **1.2.3.**); clarifies survey requirements for various population groups (paragraph **2.5.**); and merges survey guide, USAFAH 36-2602, into this instruction (**Attachment 2**).

1. Scope of the Program:

1.1. For the purposes of this program, the "Installation and Unit Commander," as stated in AFI 36-2601, paragraphs 1.6 and 3.8, is the Superintendent. While commanders of USAFA organizations retain the authority to approve the administration of data collection instruments or the conduct of research within their organization, final approval authority is reserved for the Superintendent or delegated representative via the USAFA Survey Program.

1.2. HQ USAFA/XPR reviews and approves all surveys with the exception of:

1.2.1. Surveys administered by: (1) an instructor during class time or assigned as homework to students officially assigned to that instructor's section for the purposes of clarifying course-related concepts, and (2) a course director or department representative during class time or assigned as homework to multiple sections of a common course for purposes of assessing course-specific instruction. Post-course surveys mailed to graduates or to their supervisors must meet the requirements in paragraph **3.**

1.2.2. Cadets conducting surveys as part of a class or mission element directed project. Instructors and cadet project supervisors are responsible for ensuring cadets comply with this guidance and adhere to USAF and USAFA policy. Paragraph **2.5.** on surveying specific populations applies. Additionally, these surveys and any research reports or briefings must include the following disclaimer:

"The information presented herein is based on an academic or mission element directed project. It represents only the views of the individual conducting the project and in no way represents the views or an official position of the USAF or the USAF Academy. Recommendations and results are for academic and training purposes only and do not represent or bind the USAF or the USAF Academy."

1.2.3. Point of Service customer service surveys. These include only those surveys that are completed by a customer at the time of service.

1.2.4. Other exceptions as listed in AFI 36-2601, paragraphs 1.1 through 1.6, such as occupational surveys, official audit surveys, and internal reporting requirements.

2. Survey Request Procedures:

2.1. Users who seek approval to administer a survey must provide the following information to HQ USAFA/XPR, 2304 Cadet Drive, Suite 300, USAF Academy CO 80840-5002 at least 4 weeks prior to administration of the survey:

2.1.1. Project Officer or Sponsor Information. Name, title, office symbol, telephone or fax number, duty or organizational address, and e-mail address of the project officers. External researchers and non-USAFA organizations wishing to survey Academy personnel must obtain a USAFA sponsor to support and oversee the survey project and ensure compliance with USAFA survey policy. USAFA employees who want to survey Academy personnel for an academic degree of professional certification are considered external researchers and must obtain an Academy sponsor.

2.1.2. Copy of the Data Collection Instrument. These instruments take a variety of forms; *e.g.*, paper surveys or questionnaires, electronic surveys, telephone interview guides, and focus group questions. The instruction section of the survey should include a Privacy Act Statement when required by AFI 33-332, *Air Force Privacy Act Program*, a statement that the survey is vol-

untary, and a statement that nonparticipation in any part of the survey will not result in any adverse action against the individual.

2.1.3. Purpose and Justification for the Proposed Project. Describe the rationale for the conduct of the data collection project. Clearly state the goal and the expected outcome of the project.

2.1.4. Statement of Benefit and Type of Academy Support Required. Describe how the sponsor's organization and the Academy will benefit by the proposed project. OPRs should identify what benefits they expect to gain via Academy support. Clearly specify the type and level of Academy support required by the project.

2.1.5. Type of Respondent. List all that apply. Types of respondents may include USAFA cadets, active duty military at USAFA, active duty military not stationed at USAFA, DAF and NAF civilians at USAFA, DAF and NAF civilians not at USAFA, family members of active duty military stationed at USAFA, family members of active duty military not stationed at USAFA, retired members of the armed forces, and members of the general public.

2.1.6. Proposed Sample Size and Sample Selection Method. Specify the number of individuals that will be contacted for data collection and how they will be selected for participation. For information on sampling techniques and optimal sample sizes, contact HQ USAFA/XPR.

2.1.7. Data Collection Methods, Frequency of Administration, and Planned Analyses. Describe the method used for collecting data; *i.e.*, paper and pencil, focus group interviews, or electronic methods such as e-mail or web survey. Also indicate the frequency of data collection. Describe how the data will be analyzed.

2.1.8. Timeframe. Specify the proposed dates for administration of data collection instruments.

2.1.9. Use of Results. Specify how and when the aggregate results will be used. Examples include internal organizational use, presentations, an article published in a referred professional journal, master's thesis, doctoral dissertation, or research report.

2.1.10. Feedback Plan. Describe how and when the respondents will receive aggregate survey results. HQ USAFA/XPR has a website available for posting results.

2.2. HQ USAFA/XPR makes recommendations regarding survey format, questions, and administration plan and will not approve those surveys that violate this instruction, USAF, or USAFA policy.

2.3. Once approved, HQ USAFA/XPR issues a USAFA Survey Control Number (SCN) that must appear on the first page of every distributed survey.

2.4. If the approved survey is modified in any way, the OPR must coordinate changes with HQ USAFA/XPR.

2.5. Surveying Various Populations. All surveys conducted on the USAFA or of USAFA personnel, as specified by this instruction, must be coordinated through HQ USAFA/XPR as well as appropriate USAFA organizations. Additional coordination and approval requirements for various populations as required by AFI 36-2601 are as follows:

Table 1. Coordination Requirements.

	HQ USAFA/CC	34 TRW/ CC	Labor Relations (10 MSS/DPCL) and Union AFGE Local 1867	USAF Survey Program (HQ AFPC/DPSAS)	Office of Mgmt and Budget OMB AFCA/ ITC *See Note
Active duty military stationed at USAFA	X				
Active duty military stationed elsewhere				X	
Cadets (Coordination and approval through HQ USAFA PL/ CC for Preparatory School cadets)	X	X			
DAF/NAF civilians at USAFA	X		X		
DAF/NAF civilians elsewhere				X	
Family members of active duty at USAFA or retired military personnel accessing USAFA services	X				
Other personnel (*i.e.* – family members of retirees, government contractors, candidates for admission, members of the general public)	X				X

NOTE: *Contact USAFA Records Management (10 CS/SCBD) for necessary guidance. 10 CS/SCBD will forward the approval package to AFCA/ITC.*

3. Responsibilities:

3.1. HQ USAFA/XPR:

3.1.1. Develops and implements procedures for survey operations at USAFA.

3.1.2. Performs a technical review of all surveys and provides advice for USAFA organizations relating to the design, administration, and analysis of surveys.

3.1.3. Obtains the necessary approval from organizations involved in a survey's administration and assigns an SCN, which indicates that the survey is approved for administration. In accordance with AFI 36-2601, obtains approval from HQ AFPC/DPSAS for requests by private individuals or organizations to survey, poll, or interview USAFA personnel.

3.1.4. Upon OPR request, provides a data file or listing of USAFA cadets and permanent personnel selected for survey administration as described in paragraph **2.1.7.**

3.1.5. Upon OPR request, assists in survey administration when respondents are gathered in one location or the survey is administered via the USAFA intranet. If requested, assistance may also include an overview briefing, survey packets, and pencils.

3.1.6. Upon OPR request, provides statistical analysis and briefing support.

3.1.7. Upon request, develops, administers, and supports the dissemination of survey results.

3.2. Survey OPR:

3.2.1. Develops a survey using sound practices. Use **Attachment 2**, *Survey Guidelines*, to ensure the best possible survey and survey sample. When necessary, contact HQ USAFA/XPR for assistance prior to the development of a data collection instrument to ensure efficient survey development. Submits a request for a USAFA SCN from HQ USAFA/XPR in accordance with paragraph **2.**

3.2.2. Links the survey goals and objectives with the content of the data collection instrument. Ensures that the data collected will address these goals and objectives. Provides adequate time for proper survey development, administration, and analysis.

3.2.3. Avoids, if at all possible, asking personal information (*e.g.*, SSN, ethnic category, gender). Any survey requiring SSN must comply with AFI 33-332, *Air Force Privacy Act Program.*

3.2.4. Meets ethical requirements, (such as voluntary participation, mandatory debrief or feedback, etc.) for survey administration. Does not communicate, either verbally or in writing, any information that could reasonably allow identification of individual survey respondents to any individual or group either within or outside of the USAFA. Ensures no administrative action is taken against any individual as a result of his or her responses to a survey or election not to participate in a survey.

3.2.5. If possible, uses computer-scannable USAFA Form 159, **General Survey Answer Sheet**, or USAFA intranet administration (both available through HQ USAFA/XPR) in order to expedite data analysis. If using a commercial survey, makes contract arrangements for purchase, etc., of the survey.

3.2.6. Reproduces the survey in necessary quantities.

3.2.7. Notifies all participants of administration information to ensure efficient use of respondent's time and the collection of quality data. If group administration is desired, obtains suitable location and time for survey and all other support required for the administration; e.g., audio-visual support.

3.2.8. Provides survey feedback or findings as established in paragraph **2.1.10.**

3.2.9. Authorization to release survey or research results into the public forum (*e.g.*, article or symposium presentation) will default to mission-element guidance. For research sponsored by Academy organizations, obtain sponsor approval during the authorization process to release survey or research results. Forward one information copy of survey or research results to HQ USAFA/XPR at the same time mission element review is initiated.

3.3. Researchers. In addition to following the specific USAFA Survey Program requirements, all researchers must submit research protocols for approval by the USAFA Institutional Review Board.

3.4. Personnel (HQ USAFA/DP)(10 MSS/DP). Provides data files of active duty military and DAF/NAF civilian employees for sampling purposes upon HQ USAFA/XPR request.

4. Unauthorized Surveys:

4.1. An unauthorized survey is one sent to an official USAFA address or e-mail address or administered on the USAF Academy without the approvals detailed in this instruction. All approved surveys must show some form of current authorization from the OMB, DoD, or must reflect a USAF or USAFA SCN.

4.2. Anyone who receives an unauthorized survey should notify HQ USAFA/XPR or the Military Personnel Flight (10 MSS/DPM) for further instructions.

5. Release of Survey Results. Forward non-Air Force inquiries regarding surveys or research conducted at USAFA through Public Affairs (HQ USAFA/PA) per AFI 35-206, *Media Relations*.

6. Form Prescribed. USAFA Form 159, **General Survey Answer Sheet**.

HARRY F. DAVIS, Col, USAF
Director, Plans and Programs

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

Abbreviations and Acronyms

OPR—The Officer of Primary Responsibility

SCN—Survey Control Number

Attachment 2

SURVEY GUIDELINES

A2.1. Introduction. The dictionary defines a survey as "a systematic collection and analysis of data on some aspect of an area or group." That definition implies that a survey is much more than a mere collection of data about a subject with which you have some interest. Conducting a survey involves a lot of thought during development of the survey itself and interpreting the data after administration. Only after careful processing and analysis does the raw data become information useful to you, the developer, or decision-makers. The purpose of this guide is to help you develop, collect, analyze, interpret, and evaluate useful data about people's attitudes and opinions via a survey.

Types of Surveys and Advantages and Disadvantages of Each

A2.1.1. Surveys can be divided into two categories, based primarily upon their extensiveness. If you ask questions to all members of a group you're interested in studying, for example, the entire Cadet Wing, you are conducting a census. Much more common is the sample survey. A sample is a representative part of a whole group or total population. In a sample survey, you collect data from a portion of the total group and draw inferences about the whole population based upon the responses of those persons in the sample.

A2.1.2. Each type of survey has its advantages and disadvantages. In sampling a portion of an entire population, it is possible to collect data in far less time than would be necessary when conducting a census. Rapid turn-around time may be a consideration for you when gathering data for decision-makers. The smaller amount of data gathered in a sample can also mean cost savings via less data collection, formatting, and analysis. Use of computer-scored answer sheets or web-based surveys enhances both the cost and time savings. Finally, sampling allows the surveyor to give more attention to returns to help ensure data are the best possible. In essence, quality control is enhanced and more precise information is possible.

A2.1.3. The disadvantages of sampling (and implicitly, the advantages of a census) are few, but are important. Risk is involved whenever you use a sample from a population to infer something about the entire population because you're dealing with partial information. If a certain amount of risk is not acceptable, then you should conduct a census instead of a sample survey. Also, to avoid allegations of biased data, the surveyor must be careful to select a sample that is representative of the entire group. Without such, the survey may well produce misleading data and form the basis of erroneous interpretations. Minimizing these problems will be addressed later in this guide. And finally, the last major problem in sampling is determining the size of the sample. The size of the sample will depend upon many variables and the amount of risk you are willing to accept. There are some fairly standard guidelines for helping you choose the proper sample size. Additionally,
HQ USAFA/XPR will be glad to provide technical guidance in these sometimes complex matters.

A2.2. Purpose, Hypothesis, and Survey Plan. The first steps in producing a survey are potentially the most important. We'll discuss them in detail in this section. The purpose determines where you're going with the survey. How you know that you're there, or what you expect to find is dependent upon the hypothesis or research questions you've used. And the survey plan is the "roadmap" for the route. Skimping on any one of these important early steps can cause the remaining steps in the process to be wasted effort.

The Purpose

A2.2.1. The first step in producing a survey is defining the purpose of the survey. If you're not sure of the nature of the problem, it is tough to decide what kind of data you need to collect or what it means once you've analyzed it. It's helpful to ask the "why?" and "so what?" questions at this stage of the process. If there are insufficient answers to those questions, perhaps there's another way to gather information about a problem that is better than surveying. If you do survey, it's important that you design it to help answer only the stated problem and not cloud it with other "interesting" objectives and questions.

The Hypothesis

A2.2.2. Stating the hypothesis, objective, or research question becomes possible once you've clearly stated the problem. The hypothesis should be an educated guess of the answer to the problem. It should be based on your prior experience in the area or research you've done to learn about the problem. If you have little or no basis for formulating a hypothesis, instead develop one or more questions to frame the scope of your survey.

A2.2.3. For example, say the problem you wish to investigate is decreased use of the base gymnasium. An obvious question, perhaps based on comments you've overhead, is "Are personnel satisfied with the base gym?" That would be a suitable research question. However, a survey questionnaire constructed around this sole question designed to gather opinions of base personnel regarding the use, or lack thereof, of the gym and reason for it would not get at other possible factors contributing to the decreased use of the gym. Perhaps the number of personnel assigned to the base is now lower or use may be cyclical, related to the seasons. Thus, by relying on a survey developed without clear and educated reasoning and generating an incomplete research question or hypothesis, you may be blinded to the real causes of the problem.

A2.2.4. When you develop a hypothesis, take care to avoid moral statements (unless you're interest is in how people react to such statements) and biased statements such as "All maintenance officers are good leaders." It's best to avoid words like *should, best, good, bad*, and *ought*. Also, word the hypothesis as specifically as possible. Avoid words such as *most* and *some*. The more specific you are in what you're seeking, the simpler it will be to design the survey to answer that question and less will be available for ambiguous interpretation.

A2.2.5. The well-formulated hypothesis translates the purpose into a statement that can be scientifically investigated. You will face much less difficulty in developing a valid survey if you take care and do this step thoroughly. Remember the saying "garbage in equals garbage out?" It's important to preclude loading the "garbage" into your survey at this early stage. So take the time here to formulate a reasoned hypothesis or research question, and you're much less likely to get "garbage" out after completion of your survey project!

The Survey Plan

A2.2.6. Development of a survey plan is the next step in constructing a well-designed survey. The purpose of the survey plan is to ensure that the survey results will provide sufficient data to provide answers to the problem or area you're investigating. The three parts of the survey plan are the data collection plan, the data handling plan, and the analysis plan.

A2.2.7. The data collection plan helps ensure that the *proper* data are collected in the *right* amounts. The *proper* data depends upon your hypothesis and how you plan to analyze the data. For example, if

you plan to analyze your results by grade (or grade group) to test a hypothesis, then in order to obtain the proper data, you must collect information from respondents in each grade (or grade group). The *right* amount of data pertains to sample data. Recall that when sampling instead of conducting a census, you assume some risk in making inferences to the entire population. The amount of that risk is determined by the size of your sample. The amount of risk you are willing to accept should be stated in your analysis plan. In the example above, you'll need to see that each grade (or grade group) responds at a high enough rate to ensure you're meeting the minimum acceptable risk level. We'll cover the concept of proper sample size further under sampling methods. Other advice is available from the personnel in the HQ USAFA/XPR.

A2.2.8. Deciding how you are going to handle your data (data reduction and reformatting) is also part of the optimal survey plan. Its purpose is to identify up front and to decrease as much as possible the amount of data handling you will have to do. If your collection plan calls for a large amount of data, you would be best served by using a computer to aid analysis. Computer-scannable (or "bubble") answer sheets or web-based surveys can save you a great deal of time and minimize data handling errors. Such answer sheets make it unnecessary for you or your assistants to manually transfer the answers into a computer or even through your calculator. And of course, the fewer steps involved in handling the data, the less likely it is that someone will make an unintended error during its handling. HQ USAFA/XPR help computer-scan answers coded on USAFA Form 159. A strong potential for error and tedious corrective work lies in data handling. Proper care in developing this plan can preclude much trouble later.

A2.2.9. The surveyor needs to realize that use of computer-scannable answer sheets dictates the use of close-ended questions. A close-ended question lists possible answers from which the respondent chooses one he or she likes best. The common multiple-choice question is an example of a close-ended question. The open-ended question is one to which respondents write the answer out in their own words. Although the open-ended question seems to be superior, the wide variety of answers generally provided turns out to be a handicap later. Open-ended questions can generate an infinite number of possible answers. Because you cannot analyze an infinite number of answers, you must devise some method to categorize these answers into a smaller, more manageable group. Otherwise, you will spend an inordinate amount of time reading, comparing, categorizing, and recording each answer. Much of this time can be saved if you use care in developing the questionnaire and constructing your own categories in advance. Construct each question so that every possible major category of response is contained in the answer list. By having the survey respondent, not you or your assistants, categorize the answer, you will collect more valid, reliable, and accurate information than if you did the categorizing yourself. Then, all the computer must do is count the number of answers in each category.

A2.2.10. Finally, an analysis plan ensures that the information produced by the analysis will adequately address the original hypotheses, objectives, or questions. It also ensures that the data analysis is compatible with the data collected. We've included helpful survey review guidelines in Appendix 1.

A2.3. Sampling Techniques. Earlier, we touched upon concerns with sampling surveys about risk of error, choosing a representative sample, and determining the size of the sample. In this section, we'll discuss these further, explaining methods for dealing with those concerns.

Sampling Methods and Sample Size

A2.3.1. Recall that your goal, as a surveyor, is to determine what some group of people thinks or feels about an issue or set of issues. Unlimited resources of time, money, manpower, and others would allow for collection of accurate data by way of a census. Since we don't have unlimited resources, we are often forced to ask questions of a sample of the entire population. Since we want to discover the views of the whole population by asking only a sample, we want to say with as much confidence as possible that the views of the people in the sample represent those of the entire population. Two things are necessary to ensure a high level of confidence (conversely, a low risk of error) that the sample represents the population: an unbiased sample and a sufficiently large sample. You can decrease your risk in these areas by enlarging the sample (which, to a point, generally decreases sampling error) and by using a sampling technique known as random sampling. In a random sample, each member of the population has an equal chance of being selected. Because a random sample contains the least amount of sampling error, we say that it is an unbiased sample. Note that a random sample is not error free, but rather has the minimum possible amount of error. And although nonrandom sampling techniques do exist, we will only briefly mention two of them here. Further discussion of nonrandom sampling is beyond the scope of this guide. If you feel you need to sample in a nonrandom manner, consult HQ USAFA/XPR for aid.

A2.3.2. The two most useful random sampling techniques are simple random and stratified random sampling. A simple random sample is one in which each person in the population has an equal chance of being selected for the sample. Additionally, the selection of one person should in no way influence the selection of another. This technique should be used with a homogeneous (the same on given characteristics of interest) population. For example, if you're interested in measuring attitudes of enlisted first-level supervisors regardless of other factors such as age or gender, you have a homogeneous sample when you select your sample on that supervisor attribute alone. You will be unable to validly make inferences from this sample, then, about male supervisors versus female supervisors. If that is of interest, then you must use a stratified random sample that we will discuss below.

A2.3.3. Two drawbacks of simple random sampling must be noted here. An obvious one is that for a large population, a large amount of time may be spent in listing and numbering the members. This can be overcome by using a unique number already assigned to each member such as SSN. When that unique number (or digit) matches the numbers extracted from a random numbers table (or computer), that member becomes part of the sample. The other drawback is that a simple random sample will not adequately represent many diverse population characteristics unless the sample is relatively large. To use the example above, if you are interested in knowing about enlisted first-line supervisors opinions taking into account the attributes of age and gender, a simple random sample would need to be very large to ensure that the distribution of people among all these factors is equivalent to (or representative of) the population as a whole. Again, in that case, you must use a stratified random sample technique.

A2.3.4. The stratified random sampling method is used either when a population is heterogeneous (that is, composed of unlike elements; such as civilian and military personnel, or officers of different ranks) or, as discussed above, when you desire to obtain a representative sample across many attributes. A stratified random sample is really a combination of independent samples selected in proper proportions from homogeneous groups within the larger population. If one group is proportionally larger than another, its sample size should also be proportionally larger. The number of groups to be considered is determined by the number of population characteristics you wish to examine. Often, the survey plan will determine some or all of the groups. For example, if you wish to compare junior enlisted, NCO, and officer segments, by gender at the Academy, each of these will be a separate group. You would have six independent groups (3 rank categories by 2 gender categories). Once

you've divided the population into the desired homogenous groups, you then randomly sample each group. It's important that each subgroup in the sample be represented in the sample in the same proportion to the other subgroups as they are in the total population. Let's assume that you know (or can estimate) the population of Air Force active duty personnel at the Academy to be distributed as follows: 73 percent male, 27 percent female, 30 percent junior enlisted, 25 percent NCOs, and 45 percent officers. With that you can determine the approximate proportions of our six subgroups in the Academy population:

* Junior Enlisted, Male	.30 x .73 = .219
* Junior Enlisted, Female	.30 x .27 = .081
* NCO, Male	.25 x .73 = .183
* NCO, Female	.25 x .27 = .068
* Officer, Male	.45 x .73 = .329
* Officer, Female	.45 x .27 = .122

A2.3.4.1. Thus, a representative sample of the Air Force Academy active duty population (by rank category and gender) would be composed of 21.9 percent junior enlisted males, 8.1 percent junior enlisted females, 18.3 percent male NCOs, 6.8 percent female NCOs, 32.9 percent male officers, and 12.2 percent female officers.

Nonrandom Sampling

A2.3.5. Nonrandom sampling techniques include systematic sampling and judgment sampling. Systematic sampling is primarily used for its ease and speed of identifying participants. In this method, simply choose every, say *xth* member of a population where x is equal to the population size divided by the required sample size. For example, if you need 200 members in your sample and have a 1000 person population, you need to sample every 200/1000 (or fifth) member of the population. Obviously, this method does not allow every member of the population an equal chance of being selected for the sample and the selection of sample members depends upon initial selection (where you "start"). So both requirements for random sampling (equality and independence) are violated. Judgment sampling relies on an expert on the issue being studied to define the members that should make up the sample. Again, both requirements of a random sample are violated. Nonrandom sampling of any type will not necessarily be representative of the overall population. This will affect your ability to confidently generalize results of the survey to the population since you may not be sure to which segment of the population the results will apply. Generally, avoid using nonrandom sampling.

Risk

A2.3.6. Besides deciding upon which sampling method you will use, you also should be aware of factors that affect the size of the sample you will draw upon. Recall, from earlier discussions, that when you sample, you are dealing with only partial information and that there is an amount of risk of being wrong when inferring something about the total population on the basis of sample information. Hopefully, in the analysis portion of your survey plan, you identified the amount of risk you are willing (or allowed) to take. This amount of risk relates directly to the size of your sample. Stated simply, the less risk you are willing to take, the larger your sample must be. The number of groups (for example, officer and enlisted) you are planning to examine within the population also affects the sample size.

Each of the groups (in this case, officer and enlisted personnel) must be sampled and each of the samples must be large enough to ensure satisfying your risk level.

A2.3.7. Risk, as it relates to sample size determination, is specified by two related factors: the confidence level and the precision range. To minimize risk, you should have a high confidence (say, 95 percent) that the true value you seek (the actual value in the population) lies somewhere within a small interval (say, +5 percent) around your sample value (your precision). A baseball analogy may help explain confidence level and precision and their relationship. A pitcher may think he can get very few of his pitches over the exact center of home plate. But since home plate is 17 inches wide, he may think he can get 95 percent of his pitches over the center of the plate with a precision of plus or minus 8-1/2 inches (a 95 percent confidence level). If home plate was widened to 30 inches, he may feel 99 percent confident. So, when we widen the range of precision, we increase our confidence level. Likewise, if we reduce the range, we reduce our confidence level. Most survey developers use a 95 percent confidence level and a $\pm$5 percent precision level as the absolute minimum. There are fairly standard ways to determine sample size, given a desired confidence level and precision. We will not include the formulas here, but suggest you consult with the Academy's survey OPR, HQ USAFA/XPR for help in this area.

A2.4. Questionnaire Development. The final step in preparing the survey is developing the data collection instrument itself. The most common means of collecting data are the interview and the self- or group-administered questionnaire. Due to the popularity of the questionnaire, as well as standardization, respondent privacy (anonymity) and the relative cost-effectiveness compared with the interview, this section concentrates on the development of the questionnaire.

Disadvantages of Questionnaires

A2.4.1. Although the questionnaire does have formidable advantages, you should be aware of several disadvantages of the questionnaire. You can minimize these disadvantages by careful survey planning. The primary disadvantages of the questionnaire are nonreturns and misinterpretation. Nonreturns are questionnaires or individual questions that are not answered by the people to whom they were sent. Although nonreturns decrease the sample size (which can be overcome by sending out more questionnaires), the more important point is that nonreturns could introduce the possibility of bias. For example, if you're surveying to determine the attitude of a group about a new policy, those afraid to speak out may be the majority of the nonreturns. This would introduce a nonrandom bias into your survey results, especially if you found that only a small number of returns were in favor of the policy. Nonreturns cannot be overcome entirely, but we can minimize them. We will discuss methods for doing so in this section. Misinterpretation occurs when the respondent does not understand either the survey instructions or the survey questions. If respondents become confused, they will either give up on completing the survey or answer questions in terms of the way they understand it, but not necessarily the way you meant it. The questionnaire instructions and questions must use terms that have commonly understood meanings. If new terms must be used, be sure to define them so all respondents understand the intended meaning.

A2.4.2. The secret in preparing a good survey questionnaire is to take advantage of the strengths of the questionnaire while minimizing the number of nonreturns and misinterpretations. We provide some suggestions below to help.

Parts of a Questionnaire

A2.4.3. A questionnaire usually contains three parts--the cover letter, the instructions, and the questions. These must work together to have a positive impact on the success of the survey. If used, the cover letter should explain to the respondents the purpose of the survey and motivate them to reply truthfully and quickly. If possible, it should explain why the survey is important to them, how they were chosen to participate, and who is sponsoring the survey (the higher the level of sponsorship the better). Also, strongly stress the confidentiality of the results, if appropriate. A well-written cover letter can help minimize nonreturn problems.

A2.4.4. The instructions must be clear in explaining how to complete the survey and where to return it. If you, as the survey developer, are not present when respondents complete the survey, the instructions substitute for your presence, so anticipate any questions or problems that may arise and attempt to prevent them from occurring by writing good, clear, and unambiguous instructions. If you plan to use computer-scannable answer sheets, explain how you want the respondents to fill them in--what portions to use and what portions to leave blank. If you need the respondent's SSN or name included on the survey for tracking or analysis purposes, you will need to tell the individual the statute, instruction or rule authorizing you to ask for the SSN, the uses that will be made of the SSN, and if he or she is legally obligated to provide the SSN
(see AFI 33-332, *Air Force Privacy Act Program*). This information must be placed on the survey itself, usually in the instructions. Since SSNs are personal and unique to each individual, they must be protected as "For Official Use Only (FOUO)." Do not disclose them to anyone without an official need to know. The last four or six digits of the SSN would not be a personal identifier since several people could have the same combination of numbers. If you can track or do analysis using only the last four or six digits the above SSN notification will not be necessary. The third and final part of the survey is the set of questions. They should not be vague or encourage feelings of frustration that could lead to nonreturns.

Common Types of Questions

A2.4.5. There are four common types of questions you may choose when designing your survey. Decisions regarding which types to use should depend on your survey plan. The classifier or background question is used to obtain information about the group studied, such as age, gender, grade, level of assignment, etc. This information is used when you are categorizing your results by various subdivisions such as age or grade. Therefore, these questions should be consistent with your data analysis plan. A second type of question is the multiple choice or close-ended question. Use this type of question to determine the opinions on issues by allowing the survey respondent to choose an answer from the list you've provided. The intensity question, a third type, is a special form of the multiple-choice question, and is used to measure the intensity of the respondent's feeling on a subject. These questions provide answers that cover a range of feelings. The final type of question is a free response or open-ended question. This type requires respondents to answer the question in their own words. It can be used to gather opinions or to measure the intensity of feelings but can involve a great amount of data handling and reduction after collection. Multiple-choice questions are the most frequently used types of questions in surveying today. Therefore, we will concentrate primarily on factors relating to their application.

Hints for Question Construction

A2.4.6. Many researchers have studied the art of question writing and from their experiences, they offer valuable advice. Below are some helpful hints for your consideration.

A2.4.6.1. Keep the language simple. Analyze your audience and write on their level. Avoid using technical terms or jargon. Attention here can preclude misunderstanding and possible invalid responses.

A2.4.6.2. Keep the questions short. Long questions tend to become vague and confusing. A respondent may read the question leaving out a clause and thus change the meaning of the question and hence, how he or she will answer.

A2.4.6.3. Keep the number of questions short. As the developer, ask yourself the "so what?" and "who cares?" tests to each proposed question. Ask only questions that will contribute to your survey. Although there is no commonly agreed upon maximum number of questions that should be asked, research suggests that higher return rates correlate highly with shorter surveys. However, don't leave out questions that will provide necessary data simply because it will shorten your survey. If the information is necessary, ask the question.

A2.4.6.4. Limit each question to one idea or concept. A question consisting of more than one idea (commonly referred to as a "double-barreled" question) may confuse the respondent and lead to a meaningless answer. Consider, for example, the question: "Are you in favor of limiting access to the USAFA hospital and decreasing benefits? What would a yes (or no) answer mean? And which part of the question is the respondent answering?

A2.4.6.5. Do not ask "leading" questions. These are questions worded in a manner that suggests an answer. Some respondents may give the answer they think you're seeking instead of what they truly feel. Such questions may open your survey to criticism. A properly worded question gives no clue as to which answer you may believe to be the correct one.

A2.4.6.6. Use terms such as *good, fair, and bad* sparingly, if at all. These terms do mean different things to different people. Remember, one of your goals in developing a survey is to minimize the possibility of misinterpretation and therefore error. By avoiding the use of such words, you should preclude some problems in later data interpretation.

A2.4.6.7. Allow for all possible answers. Respondents who cannot find their answer among your list will be forced to give an invalid reply or, potentially become frustrated and refuse to complete the survey. The first step is to word the question so as to reduce the number of possible answers. Avoid two-answer question (except for obvious situations such as gender). If you can't avoid such questions, add a third option such as "no opinion," "don't know," or "other." These may not get the answers you need, but they will minimize the number of invalid responses.

A2.4.6.8. Avoid emotional or morally charged questions. Some respondents may feel that the survey is getting too personal and refuse to answer the questions and/or complete the survey.

A2.4.6.9. Understand the *should-would* question. Respondents often answer "should" questions from a social or moral point of view while answering "would" questions in terms of personal preference. Your awareness of this will help ensure that the best question is asked and will aid interpretation of the data.

A2.4.7. Questions in which you wish to measure the intensity of the respondent's feeling or attitude on a topic are often called intensity questions (for example, responses could range on a scale from "Strongly Disagree" to "Strongly Agree"). Use of such questions allows you to obtain more quantitative information about the survey subject. The most common and easily understood question involves the use of the Likert-type answer scale. It allows the respondent to choose one of several degrees of

feeling about a statement. The "questions" are in the form of statements that seem either definitely favorable or definitely unfavorable toward the matter under study. For your aid, we've included in Appendix 2, a list of sets of responses that you may wish to use. These sets have been studied and found to exhibit balance and enough "distance" between each response within a set to help the respondent validly differentiate between answers. Also, use of any one of these response sets, due to the research and mathematical principles underlying each, generates interval data. Analysis of interval data can validly produce statistics such as mean, variance and standard deviation, along with frequencies and percentages. Use of response sets without such careful scale anchor values generate nominal or ordinal data that are properly described via frequencies or percentages of responses per category. Discussion of this area is beyond the scope of this guide. Should you have questions with regard to use of response sets, nominal, ordinal and interval data, and appropriate statistics to use with each, call the USAFA Office of Institutional Research and Assessment.

Bias

A2.4.8. Some final comments about bias and ways to combat it deserve to be mentioned here. The primary sources of bias in a questionnaire are a nonrepresentative sample, "leading questions," question misinterpretation, and untruthful answers. The survey developer can do little to preclude untruthful answers, save stating as strongly as possible the importance of the information requested in the cover letter. You can limit the probability that questions will be misinterpreted by following some of the hints above designed to produce clear answers and by pretesting the survey (discussed below). Leading questions, those that are worded to suggest an answer, are discussed above in the question construction hints. Remember, you are trying to discover what the respondents actually feel about something, not what they think you want to hear.

Minimizing Nonreturns

A2.4.9. Survey developers can expose themselves to possible nonrepresentative sample bias in two ways. First, he or she chooses a nonrepresentative sample. Earlier discussions on sampling techniques address ways of minimizing this occurrence. Second, having a large number of nonreturns can introduce bias. The following techniques can be useful in minimizing the number of nonreturns:

A2.4.9.1. Use follow-up letters. These letters are sent to nonrespondents after a few weeks asking them again to complete and return the questionnaire. Obviously, you will have to mark the survey in some unobtrusive manner if you wish to target the letter to only nonrespondents versus sending it to the entire sample. Consider providing a fresh copy of the survey with the follow-up letter. This often increases the return rate as some people may have misplaced or destroyed the original survey since receiving it.

A2.4.9.2. Make your questionnaire easy to read, short, and simple to complete. The shorter and less complex the survey is, the more likely the respondent is to take the time necessary to complete it.

A2.4.9.3. Use the cover letter to motivate the person to return the questionnaire. If possible, as a motivator, have the letter signed by someone known and respected by the target audience for the questionnaire. Additionally, try to ensure that the individual will be perceived by the audience as having a vested interest in the information needed.

A2.4.10. Proper use of these techniques can lower the nonreturn rate to within acceptable levels. No matter what you do, that rate will never be zero. Make sure that the effort and resources you spend are proportional to the return you expect to get.

A2.5. Pretest the Survey Questionnaire:

A2.5.1. Perhaps one of the most important steps in preparing a good survey is pretesting it. The purpose of the pretest is to see how clear your instructions and questions are to people like those who are potential survey respondents. Pretesting your survey can help you overcome common errors that you as the developer, being so close to the survey and the subject matter, may not catch. It will also give you a feel for how long it will take the respondents to answer the complete survey.

A2.5.2. If possible, you should choose a small group of people (10 or less should be sufficient) you feel are representative of the group you plan to survey. For example, if the population you are interested in getting information about is enlisted NCOs on the Academy, choose several NCOs (not in your chosen sample pool) to meet with you and take the survey. Pretesting the survey with officer "subjects" will probably not give you results you would feel confident about applying to NCOs.

A2.5.3. Once you have your pretest participants gathered together, let them read through and answer the questions without interruption. Note how long it takes the participants to complete the survey. Once everyone is through, ask them to provide you with verbal critiques of all parts of the survey, to include the instructions and cover letter (if you plan to use one). Don't be satisfied with finding out merely what confused or alienated them. Remember, these folks can provide you with a lot of helpful insights. Question them enough to make sure that what they thought something meant was really what you intended it to mean. Use the "hints" listed above concerning question construction as a "checklist" and go through them with your test group to get reactions on how well the questionnaire satisfies these points.

A2.5.4. If you are unable to gather the pretest participants together for a session, you may still pretest the survey by providing them a copy of the survey and asking them to complete it and provide comments. You should provide some "pretest"-specific instructions and include a few "pretest" questions, for example, asking how long it took to finish the survey. The additional information and comments should prove to be quite helpful in finalizing the survey.

A2.5.5. Finally, take the information you have learned from the pretest and revise your instructions and survey questionnaire as necessary to ensure you are asking for the information you desire in the clearest manner. Edit and adjust the questionnaire to decrease the time you expect it will take respondents to finish the survey if you found that it took the pretest people longer than expected to complete. Once you have finished this process, you should be confident that you have a survey that communicates clearly and that will provide you with useful data. It's here that you determine what statistics you'll use and how much risk you wish to take when stating your conclusions. Each of these decisions will affect the amount and type of data you collect and how you will reduce it. The most common error committed in statistical analysis is using a statistical technique with inappropriate data. While the results of such analyses appear to be legitimate, they are actually impossible to interpret correctly.

A2.6. Survey Administration:

A2.6.1. Paper surveys (vice surveys conducted via telephone or other electronic means) may be administered in a group setting, by mail out, or randomly (for example, left on the counter of your work section for customers to pick up and complete). Each has its advantages and disadvantages. Group administration of a survey has the advantage of having respondents available (though all may not show up) and dedicated to completion of the survey. Therefore, you should obtain a near 100 per-

cent response rate. This method also has the advantage of immediate response. However, group administration requires you, if you are the survey's OPR, to do some planning and set-up prior to survey administration. You will need to obtain a room large enough to seat all respondents, preferably one with tables or desks. You will also need to notify all respondents of the date, time, and location of when to report to complete the survey. Also, all materials, including the questionnaire itself, answer sheets (computer-scannable) if necessary, pencils, etc. must be readied. Some find it useful to make up folders or packets containing one each of all necessary materials beforehand. Also, group administration has the advantage of you or one of your coworkers being available there to answer any questions about survey instructions or wording that may arise.

A2.6.2. Surveys administered by sending a copy of the questionnaire and, if necessary, an answer sheet through mail or distribution to the people in your sample is the more common method. It's important when using this method to establish a cut-off date for return of the surveys and to maintain that date. The entire survey project can drag on longer than is prudent unless you do so. If your return rate is low, use some of the techniques mentioned earlier (e.g., follow-up letters, etc.) to try to get an improved response, but postponing the cut-off date or continuing to count surveys after that date will likely cause further problems. You will probably be "squeezing" the time you or your team have to properly analyze and interpret the data and report it to your superiors. Mailing labels for each respondent must be prepared, as well as the package of survey contents (cover letter, questionnaire, answer sheet [if applicable]). Although this method has the advantage of allowing the respondent to answer the questionnaire when they have the time to do so, it also has some disadvantages to you, as the survey developer or OPR. Because you have less control about when and how the respondents complete the survey, you are likely to have a lower response rate than under group administration circumstances. You may wish to follow some of the techniques listed earlier to help decrease your nonreturn rate. A significant disadvantage is that you will not be present to answer questions that a respondent may have while completing the survey, so extra care in wording the instructions and the questions themselves is warranted.

A2.6.3. Distributing surveys randomly (for example, leaving them on the counter of your service work area to allow customers to take a survey and complete it), may seem to be the simplest and most appropriate way to get feedback from your customers. However, although the distribution and collection are often simple, several important drawbacks must be mentioned. It is highly unlikely that you will sample a truly random sample of your customers by using this method. You are much more likely to get the "edges" of your customer population; either those really satisfied or dissatisfied with the service. We discussed earlier some of the disadvantages of nonrandom sampling when attempting to interpret the responses received. If you really are simply interested in obtaining feedback from the people at either end of the spectrum, then this distribution method may be appropriate. However, given the many problems with nonrandom sampling, you should generally try to avoid having the survey distributed by this means.

A2.7. Survey Analysis:

A2.7.1. Earlier we discussed the importance of considering, before developing the questions, what sort of data you will need to provide useful information about the issue of concern. The types of analyses you can appropriately do depend upon what kind of data were collected. As mentioned in the section above about questionnaire development, use of certain anchored scales provides you with interval data. Interval data can validly produce descriptive statistics such as mean, variance, and standard devi-

ation. Use of less defined scales generates nominal or ordinal data that are properly described by frequencies and/or percentages.

A2.7.2. Too often, your tendency may be to simply "crunch" all the numbers to get the usual frequencies or percentages yourself during the analysis step. And, if the survey is a very simple one, that may suffice. However, it may be much more efficient and provide you with a more complete "picture" of your data by using methods, such as computer scannable answer sheets or web-based surveys that allow quick and efficient data analysis. For example, the base chapel staff desires to discover what the users of base chapel services believe concerning several aspects of a proposed chapel redesign effort. The chapel staff constructs a simple 10-12 question survey for completion after users hear a briefing from the architects about the project. Although it would be tempting to simply pull out your calculator to analyze 20-30 responses to this short questionnaire, having the respondents mark their answers on a computer-scannable form allows you to have the computer "crunch" those numbers for you. Not only will you save yourself time and effort, the chances of error are minimized and the analysis is often completed much quicker than you could do so manually. Also, depending upon your questions and scales, you may be able to get information about the mean and other statistics that will provide you and your audience (readers, Wing Commander, etc.) a more full "snapshot" of what the user feels about the issue. The personnel in HQ USAFA/XPR are ready and able to assist you in accomplishing this important step smartly and efficiently, as well as helping you properly interpret the analysis in order to report the findings.

A2.8. Survey Reporting :

A2.8.1. Once you've collected and analyzed the data according to your survey plan, you must decide how best to report that information. There are numerous ways to tell your audience (whether the Wing Commander, respondents, or readers of a report, among others) just what information was gained through the survey. You will of course, choose the data you report so as to answer the questions or issues that generated the survey initially. But caution is necessary when making inferences from your data (interpreting data) that you may include in your report or briefing. Stating that the data tells you more than it really does can at best be misleading and at worst, can cost large sums of money due to decisions made based upon those inferences.

A2.8.2. A mention of comparison is useful here. After analyzing the data, you may find that, statistically there is a significant difference between groups (for example, between male and female officers). However, interpretation and comparison concerns in reporting such statistically significant differences may not be practically different. For example, you used a Likert scale of 1-7 ("strongly disagree" to "strongly agree") on a survey item administered to 5,000 military and civilians. With that sample size, you found a statistically significant difference between the average military response of 4.11 and the average civilian response of 4.18. Practically speaking, both groups responded 4 ("slightly agree") on the 7-point scale. With a large sample size (that is, 1000 or more) and small variance, some very small differences can be statistically significant but not really provide you much information. If your study's results are part of a decision-making process, a better decision is often possible if you can present the results in a practical, "real world" manner. Too often, large amounts of data can overwhelm the reader or your briefing audience and they'll want to know "so what?" Asking yourself that question, from survey design (as mentioned earlier) through analysis and reporting is very important. Also, it's useful to know the difference between comparative and absolute values. For example, male officers responded differently in your study than did male NCOs, but both responded positively. Comparatively, the groups are different but when examined against an absolute scale, both

groups responded in the same manner (that is, positively). Sometimes it helps when reporting your data to comment upon the practical differences versus statistical differences and comparative versus absolute values. Often, this can provide the members of your audience, the "framework" within which they can better understand the information you've provided.

A2.8.3. Your goal in choosing how to report the data should always be, first, presenting the information in the clearest possible manner. Sometimes graphs "tell the story" better than a table full of numbers. For people who learn primarily through visual means particularly, graphical presentation is often the most effective method of reporting. Graphs, when used with text are often quite useful to highlight main points. Sometimes though, graphs may not provide enough detail, in an easily understood manner. In those cases, you may choose to report the data via a table or tables. Use of tables in an extensive manner is probably best placed in an attachment to a report or as backups in a briefing. You can put a graph of the information with necessary text in the main portion of your presentation and refer the interested reader or listener to more details provided in the tables. Examples below (**Figure A2.1.** and **Figure A2.2.**) show you how the same data may be presented in either a graphical or numerical fashion.

Figure A2.1. Gender Attitudes (By Cadet Class).

Source: Cadet Social Climate Survey

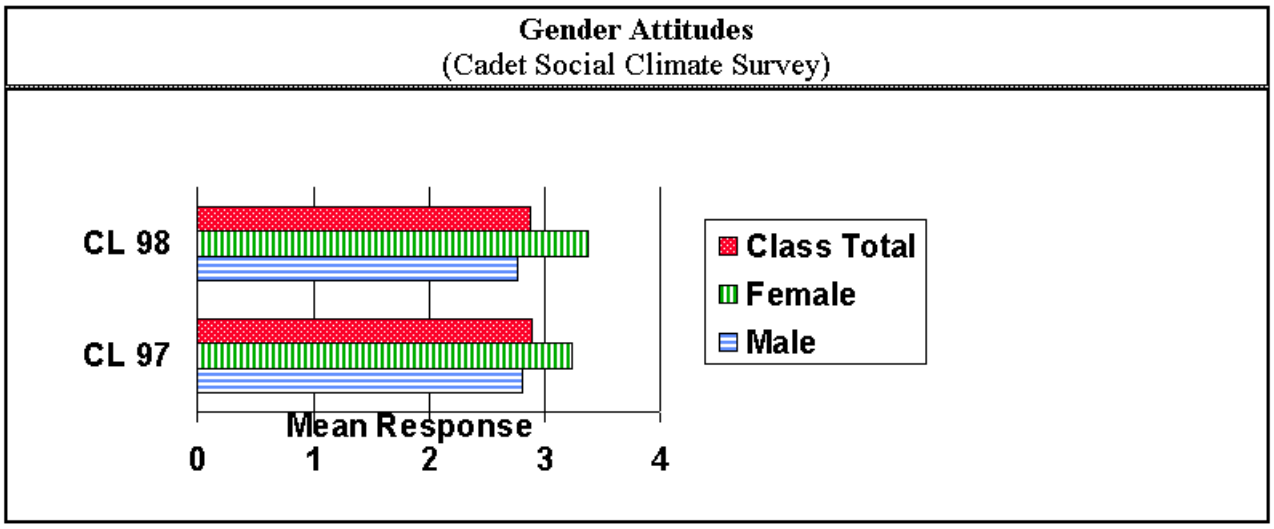

Figure A2.2. Gender Attitudes (By Cadet Class).

Source: Cadet Social Climate Survey

Gender	Class of 1997	Class of 1998
Female	3.23	3.37
Male	2.81	2.77
Total (by Class)	2.9	2.87

A2.9. Summary. Written surveys are often the least expensive and most reliable means to gather information about people's attitudes concerning "hot" issues. Ensuring that you get information representative of an entire population that is valid and useful in decision-making requires some work, but it can be done by "stepping through" the process discussed in this guide. Hopefully, you will use this guide as a "first check" when you've been tasked to develop a survey and throughout the survey process, including reporting the results. No single source, such as this guide can cover all possibilities or questions that may arise. Recognizing that limitation, you might choose to draw upon those with more survey experience within your organization and here at the Air Force Academy, especially within the Office of Institutional Research and Assessment (HQ USAFA/XPR).

A2.10. Bibliography: Air Force Instruction 36-2601. *The Air Force Sample Survey Program*. Washington, D.C.: Department of the Air Force, 10 Jun 1994.

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A2.11. Appendices as follows:

Appendix 1: SURVEY REVIEW GUIDELINES

NOTE: *Use the questions in this Appendix, along with AF Form 2519, All Purpose Checklist, (available electronically) to develop a checklist on Survey Review Guidelines.*

The USAFA Survey Program (HQ USAFA/XPR) uses the following guidelines to review survey requests. Where stated, as such, suggest you answer the below questions as you develop your survey:

1. The information being sought should be, in general, information the Superintendent would be willing to release to the public.

2. Is the data derived devoid of potential intelligence value, or otherwise harmful to proper mission performance?

3. Is there a specific objective for the survey other than merely to meet the requirements for the award of an academic degree, required training, or the like?

4. Does the survey contribute to the study of a relevant USAFA issue or accomplishment of a mission? If so, this intent should be stated in specific terms in the request memorandum.

5. Do the proposed administration procedures protect respondent identity?

6. Do the proposed procedures guarantee an adequate response rate within a reasonable period of time?

7. Survey or questionnaire format and structure:

7.1. Does the cover memorandum or instructions contain a statement that the survey is voluntary and that all individual responses will be protected?

7.2. If copyrighted scales, subscales, or questions are used, does the requester have permission from the authors (if required) to use the scales?

7.3. Does the requestor plan to cite the authors in any subsequent report or summary?

7.4. Do questions cover each topic area adequately?

7.5. Are the questions presented in a logical sequence?

7.6. If a computerized answer sheet is to be used, do the responses to the survey fit on such a sheet?

7.7. Has the requester obtained computer-scanning support prior to submitting the survey request?

7.8. Does the questionnaire present a neat, professional appearance?

8. Survey questions:

8.1 Are the questions not of a sensitive nature, objectionable, or in bad taste?

8.2 Other types of questions that will not be approved:

8.2.1. Misleading questions.

8.2.2. “Loaded” or “entrapping” questions.

8.2.3. “Double-barreled” items (*i.e.*, asking more than one question in a single item).

8.2.4. Questions that require an unreasonable amount of effort on the part of the respondent.

8.3. Are questions grammatically correct?

8.4. Are questions easily understood by the most number of respondents possible?

9. Response scales:

9.1. Are response scales balanced (that is, when positive and negative responses are called for, there should be equal numbers of responses on both sides of the neutral point, whether the neutral point is explicit or implied)?

9.2. Are response scales complete, covering the full range of possible answers? An “I don’t know,” “none of the above,” or “N/A,” response may be necessary.

9.3. Are responses mutually exclusive?

9.4. Are responses, when covering a continuous variable such as time, weight, etc., exhaustive?

9.5. If responses are scaled, are anchor words used that imply a gradual increase or decrease in factor of interest?

Appendix 2: SAMPLE SETS OF RESPONSE ALTERNATIVES

**Excerpted from Questionnaire Construction Manual, ARI Technical Report #P-77-1,
U.S. Army Institute for the Behavioral and Social Sciences, Fort Hood Field Unit, July 1976, (DTIC No. ADA037815)**

It is sometimes valuable and a time saver to have lists of response alternatives available to use. The tables in this section give some examples of response alternatives that have been selected on different bases. These sets do not exhaust all possibilities.

The sets of response alternatives that appear in **Table A2.1.** were selected so that the phrases in each set would have means at least one standard deviation from each other and have parallel wording. Some of the sets of response alternatives have extreme end points; some do not. The sets of response alternatives shown in **Table A2.2.** were selected so that the phrases in each set would be as nearly equally distant from each other as possible without regard to parallel wording.

Table A2.1. Sets Selected so Phrases are at Least One Standard Deviation Apart and Have Parallel Wording.

Set No.	Response Alternatives
1.	Completely acceptable
	Reasonably acceptable
	Barely acceptable
	Borderline
	Barely unacceptable
	Reasonably unacceptable
	Completely unacceptable
2.	Wholly acceptable
	Largely acceptable
	Borderline
	Largely unacceptable
	Wholly unacceptable
3.	Largely acceptable
	Barely acceptable
	Borderline
	Barely unacceptable
	Largely unacceptable

Set No.	Response Alternatives
4.	Reasonably acceptable
	Slightly acceptable
	Borderline
	Slightly unacceptable
	Reasonably unacceptable
5.	Totally adequate
	Very adequate
	Barely adequate
	Borderline
6.	Completely adequate
	Considerably adequate
	Borderline
	Considerably inadequate
	Completely inadequate
7.	Very adequate
	Slightly adequate
	Borderline
	Slightly inadequate
	Very inadequate
8.	Highly adequate
	Mildly adequate
	Borderline
	Mildly inadequate
	Highly inadequate

Set No.	Response Alternatives
9.	Decidedly agree
	Substantially agree
	Slightly agree
	Slightly disagree
	Substantially disagree
	Decidedly disagree
10.	Moderately agree
	Perhaps agree
	Neutral
	Perhaps disagree
	Moderately disagree
11.	Undoubtedly best
	Conspicuously better
	Moderately better
	Alike
	Moderately worse
	Conspicuously worse
	Moderately worse
	Undoubtedly worst
12.	Moderately better
	Barely better
	The same
	Barely worse
	Moderately worse

Set No.	Response Alternatives
13.	Extremely good
	Remarkably good
	Good
	So-so
	Reasonably poor
	Extremely poor
14.	Exceptionally good
	Reasonably good
	So-so
	Exceptionally poor
	Reasonably poor
15.	Very important
	Important
	Not important
	Very unimportant
16.	Like extremely
	Like moderately
	Neutral
	Dislike moderately
	Dislike extremely
17.	Strongly like
	Like
	Neutral
	Don't like
	Strongly dislike

Set No.	Response Alternatives
18.	Very much more
	A good deal more
	A little more
	A good deal less
	Very much less
	A little less

Table A2.2. Sets Selected so Intervals Between Phrases are as Nearly Equal as Possible.

Set No.	Response Alternatives
1.	Completely acceptable
	Reasonably acceptable
	Borderline
	Moderately unacceptable
	Extremely unacceptable
2.	Totally adequate
	Pretty adequate
	Borderline
	Somewhat inadequate
	Decidedly inadequate
	Poor
3.	Highly adequate
	Rather adequate
	Borderline
	Somewhat inadequate
	Decidedly inadequate

Set No.	Response Alternatives
4.	Quite agree
	Moderately agree
	Perhaps agree
	Perhaps disagree
	Moderately disagree
	Substantially disagree
5.	Undoubtedly best
	Moderately better
	Borderline
	Noticeably worse
	Undoubtedly worse
6.	Fantastic
	Delightful
	Nice
	Mediocre
	Unpleasant
	Horrible
7.	Perfect in every respect
	Very good
	Good
	Could use some minor changes
	Not very good
	Better than nothing
	Extremely poor
8.	Excellent
	Good
	Only fair
	Poor
	Terrible

Set No.	Response Alternatives
9.	Extremely good
	Quite good
	So-so
	Slightly poor
	Extremely poor
10.	Remarkably good
	Moderately good
	So-so
	Not very good
	Unusually poor
11.	Without hesitation
	With little hesitation
	With some hesitation
	With great hesitation
12.	Strongly like
	Like quite a bit
	Like
	Neutral
	Mildly dislike
	Dislike very much
	Dislike extremely
13.	Like quite a bit
	Like
	Like slightly
	Borderline
	Dislike
	Dislike moderately
	Don’t like

Set No.	Response Alternatives
14.	Like quite a bit
	Like fairly well
	Borderline
	Dislike moderately
	Dislike very much
15.	Very much more
	A little more
	Slightly less
	Very much less